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ABSTRACT

Chapter 1 of this document contains sets of statements adopted by the Minnesota State Board of Education or Minnesota State Legislature. They represent the hierarchy used by Department of Education staff to develop model learner outcomes for each subject area. Contents include learner values, education system values, philosophy of education, mission statements, and learner goals. Chapter 2 discusses goals of agriculture/agribusiness education. Chapter 3 lists learner outcomes that a student should be able to demonstrate as a result of participating in a grade 9-12 agricultural program. It provides outcomes common to all programs and suggests that they be the core learner outcomes for all program areas in agriculture. Outcomes are presented for the following areas: mechanics occupations; products processing and marketing occupations; supplies and service occupations; forest management occupations; horticulture occupations; natural resource management occupations; and production agriculture. Each area identifies knowledge and process outcomes. Each learner outcome is keyed to the learner goals in chapter 1 and is referenced to the cognitive, psychomotor, and affective development domains. Outcomes that focus on multicultural, gender fair, and international/global concept development are coded to indicate this emphasis. Chapter 4 explains how to transpose these learner outcomes into a local district curriculum. Curriculum development forms with instructions and eight references are provided. (YLB)

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Chapter 1

Minnesota State Board of Education

Values

Philosophy

Mission

Goals

CHAPTER I

MINNESOTA STATE BOARD OF EDUCATION

VALUES, PHILOSOPHY, MISSION, AND GOALS

School districts nationwide, and certainly in Minnesota, are constantly striving to improve the learning experiences they provide students. The last two or three decades have seen heightened interest in improving all parts of the education process, including appropriate involvement of students, parents, and the community at large.

The documents that constitute the Minnesota Department of Education's Coordinated Model for Education Improvement incorporate many of the concerns expressed and issues addressed by the public, Legislature, and reports published on the state of public education. One of these documents titled, **GOAL AND OUTCOME SPECIFICATION PROCESS**, suggests a set of procedures for appropriate involvement of the public. These procedures include public participation on the development of statements of values, philosophy, mission, and learner goals. These sets of statements are a hierarchy of increasingly specific concepts ranging from values, the most general, to learner goals, the most specific, that give form and direction to public education. Given this hierarchy, staff, skilled in subject matter and the profession of teaching, can develop very specific learner outcomes for each subject area.

The following sets of statements were adopted by either the Minnesota State Board of Education or the Minnesota State Legislature for two purposes. First, they provide a model for use by communities and school staff as they strive to improve the learning experiences they provide for residents. Second, they are the hierarchy used by Department staff and teams of educators as they develop model learner outcomes for each subject area. Only the **Mission Statement for Public Education** adopted by the Legislature gives explicit direction to public schools. All other parts of this document are models, suggestions for the consideration of residents and professionals in each district.

THE MINNESOTA STATE BOARD OF EDUCATION VALUES THE FOLLOWING HUMAN ATTRIBUTES AS PREEMINENT FOR THE CITIZENS OF THE STATE OF MINNESOTA

COMPASSION - a condition in individuals whereby each is sensitive to the conditions affecting the lives of others and each has the commitment to assist others when appropriate and possible.

COMPETENCE - a condition in individuals whereby each attains levels of knowledge, skill, and affect commensurate with his or her potential..

COOPERATIVENESS - a condition in individuals whereby each interacts with others in a manner that mutually benefits all participants in the interaction.

CREATIVITY - a condition in individuals whereby each acts or expresses self in new, improved, or unique ways.

HONESTY - a condition in individuals whereby each is fair and straightforward in the conduct of human interactions.

LEARNING - a condition in individuals whereby each continually strives to increase personal levels of fulfillment and competence in an expanding array of human endeavors.

PROBLEM SOLVING - a condition in individuals whereby each has the ability to identify, frame, and propose new, improved, or unique solutions to existing and emerging problems.

RESPONSIBILITY - a condition in individuals whereby each strives to fulfill the obligations of self-sufficiency and active commitment to the common good.

SELF-ACCEPTANCE - a condition in individuals whereby each has a positive self-image, through assertion of rights, holding personal physical and emotional well-being as an ideal, accepting personal talents with humility and personal limitations with the resolve to improve where possible and accept where necessary.

SPIRITUALITY - a condition in individuals whereby each recognizes and accepts the importance of nurturing one's inner spirit, that creative force that transcends the human and the material.

THINKING - a condition in individuals whereby each is able to judge the potential for a proposal or activity to achieve its stated purpose.

THE MINNESOTA STATE BOARD OF EDUCATION VALUES THE FOLLOWING SYSTEMIC ATTRIBUTES AS PREEMINENT FOR ALL SCHOOLS IN THE PUBLIC EDUCATION SYSTEM.

ACCOUNTABILITY - a condition in every school whereby each is able to justify its use of public resources by effectively fulfilling its mission of student learning.

EFFECTIVENESS - a condition in every school whereby each accomplishes its mission at a performance level defined by students, parents, citizens of the community and state, and their representatives.

EFFICIENCY - a condition in every school whereby each accomplishes the highest possible level of excellence with available resources.

EXCELLENCE - a condition in every school whereby the highest possible standards for performance are expected of all students and staff.

HUMAN EQUITY - a condition in each school whereby every student and staff member associated with the school is provided with appropriately designed and individually determined opportunities to achieve the highest level of excellence his or her potential allows.

RESPONSIBILITY - a condition in each school whereby each accepts and acts on the belief that: the parent(s) has primary responsibility for raising and educating the child; the community is responsible for assisting parents in areas of needs; and the school, as a part of the community, is responsible for providing learning experiences.

RESPONSIVENESS - a condition in every school whereby diversity of personal and group needs and aspirations are expected, accepted, encouraged, and routinely addressed.

SYSTEM EQUITY - a condition on the education system whereby each school is provided with the resources necessary to assist all students to achieve excellence.

WHOLENESS - a condition in every school whereby each gives necessary and appropriate consideration to the potential career needs and spiritual, social, emotional, and physical growth of each student and staff member as it designs and implements educational programs.

THE MINNESOTA STATE BOARD OF EDUCATION
PHILOSOPHY OF EDUCATION

WE BELIEVE THAT....

... Every human can learn.

... Every human must understand and accept self before he/she can become a contributing member of society.

... Human beings are becoming increasingly globally interdependent.

... Human beings maintain wide diversity in behaviors, sophistication, and values.

... Advancement of the human race requires individuals who are honest, responsible, compassionate, cooperative, creative, and competent.

... Professional educators have a responsibility to remain current with evolving knowledge about human growth and development, learning, theory, and knowledge of subject matter.

... Professional educators and elected or appointed education policy makers have a responsibility to account to the public for the excellence of the results of their efforts.

... Professional educators and elected or appointed education policy makers have a responsibility to utilize public resources prudently and efficiently.

... The education system must maintain high standards for responsiveness, human equity and system equity in the provision of educational opportunities.

... Decisions regarding planning, implementing, and maintaining learning opportunities must be vested as close to the individual learner as efficient use at public resources allow.

... Each community has a shared responsibility with the parents for meeting the needs of each child.

... Schools must implement programs that stress the intellectual development of each learner in concert with the spiritual, social, emotional, and physical development of each student.

... Staff employed in schools must model the behaviors they are attempting to assist learners to develop.

... Schools must implement systems and procedures within which human interactions enhance the development of a positive self-image in every individual.

... Schools must model and nuture creativity in learners.

... Schools must maintain opportunities for all learners to develop competence in personally selected areas of human development.

MISSION FOR PUBLIC EDUCATION

As adopted by the Minnesota Legislative Commission on Public Education and enacted into law, Chapter 240, Laws of 1985

The purpose of public education is to help individuals acquire knowledge, skills, and positive attitudes toward self and others that will enable them to solve problems, think creatively, continue learning, and develop maximum potential for leading productive, fulfilling lives in a complex and changing society.

MISSION FOR MINNESOTA STATE BOARD OF EDUCATION

The purpose of Minnesota State Board of Education is to provide the vision, advocacy, and leadership to improve significantly the quality of education throughout the state.

MISSION STATEMENT FOR THE MINNESOTA DEPARTMENT OF EDUCATION

The Minnesota Department of Education provides leadership, service, and regulation to maintain and improve an equitable, uniform and quality system of public education for all learners.

The Department provides leadership as an advocate for education by defining quality education and by seeking the resources necessary to meet the needs of all learners.

The Department provides service through informational and technical assistance that will improve the productivity and performance of students and staff, and provide opportunities for the development of the potential of all learners.

The Department regulates education by maintaining, interpreting, and enforcing Minnesota State Board of Education rules and state and federal laws.

MINNESOTA STATE BOARD OF EDUCATION

LEARNER GOALS

The State Board of Education has adopted these learner goals as a general statement of the purpose for public education, as a means of describing the type of person who would graduate from a public school in Minnesota, and as a model for local goal adoption. The State Board envisions each school district will provide an educational program so each learner will develop the knowledge, skills, and attitudes, values, and feelings to achieve each goal to the maximum extent possible.

A. In order to effectively participate in learning activities, each learner will master:

1. reading literacy to gather information and data, gain perspective and understanding, and as a leisure activity;

2. writing to explain, describe, and express a point of view and feeling;

3. listening to gather information and data, gain perspective and understanding;

4. speaking to explain, describe, express a point of view and feelings, and to discuss an issue;

5. numerical literacy to apply arithmetic functions to life situations;

6. the use of a variety of tools, including electronic technology to enhance learning;

7. viewing and observing to gather information and data, gain perspective and understanding;

8. self-expression through visual and performing arts.

B. In order to lead a meaningful life, each learner will accumulate and apply knowledge and develop the understanding:

1. to participate in lifelong learning;

2. to live successfully within local, state, national, and world political and social structures;

3. to examine personal beliefs and values and their relationship to behavior;

4. to make ethical and moral decisions;

5. to be a responsible citizen of the community, nation, and the world;

6. to practice stewardship of the land, natural resources, and environment;

7. to know the impact of human life on nature and the impact of natural phenomena on human life;

8. to express self through artistic creation;

9. of career options and the general education requirements for each;

10. of world and national economic conditions and to make informed decisions on consumer products, occupations, career needs and use of resources;

11. to select or prepare for a series of occupations which will be personally satisfying and suitable to one's skills and interests;

12. to manage personal affairs;

13. to communicate and relate effectively in a language and about a culture other than one's own;

14. of the importance of geographic location in the functioning of contemporary society.

C. In order to resolve issues and meet needs creatively, each learner will develop the thinking and decision-making skills:

1. to compare, differentiate, and relate information and facts and to apply knowledge;

2. to combine various facts, situations, and theories to formulate hypotheses or develop solutions;

3. to critique and make judgments about materials, conditions, theories, and solutions;

4. to generate and value creative alternatives;

5. to create music, visual and verbal images, and movement as a means of self-expression.

D. To value, understand, and accept human interdependence, each learner will be able:

1. to seek interactions and feel comfortable with persons who are different in race, religion, social level, or personal attributes;

2. to understand the interrelationships among complex organizations and agencies in modern society;

3. to understand society's responsibility for dependent persons of all ages in a manner consistent with the growth and development needs of those persons;

4. to understand how the citizens of the United States are geographically and socially connected to people and places in other parts of the world.

E. To value and understand the diversity of humankind, each learner will be able:

1. to base actions and decisions on the knowledge that individuals differ in many ways;

2. to base actions and decisions on the knowledge that values and behaviors differ from one social group to another;

3. to base actions and decisions on the understanding that life styles and behaviors reflect the value system of the society in which they were learned;

4. to judge other's actions with an understanding of the personal and social context of that action;

5. to understand people of other cultures through their visual and verbal arts, music, and creative movement;

6. to accept there is more than one way of being human;

7. to base actions and decisions on the understanding that as individuals move from one society to another, they can learn life styles and can learn to behave appropriately in different societal contexts;

8. to act on the belief human behavior is influenced by many factors and is best understood in terms of the context in which it occurred.

F. In order to address human problems through group effort, each learner will develop the knowledge, skills, and affect essential:

1. to act in accordance with a basic ethical framework incorporating the values which contribute to successful community life, such as honesty, fairness, compassion, and integrity;

2. to understanding the importance of working in groups to achieve mutual goals;

3. to be able and willing to provide leadership in resolving personal and societal issues.

G. Each learner will be able to effectively resolve conflicts with and among others:

1. by assuming responsibility to form productive and satisfying relationships with others based on respect, trust, cooperation, consideration, and caring for other persons;

2. by acting on the belief each individual has value as a human being and should be respected as a worthwhile person;

3. by resolving conflict in the manner most beneficial to society.

H. Each learner will be able to act on contemporary events and issues with a perspective of their historical origin:

1. by understanding the origin, interrelationship, and effect of beliefs, values, and behavior patterns in world cultures;

2. by understanding one's own culture and historical heritage through the political literary, aesthetic, and scientific traditions of the past;

3. by familiarity with the ideas that have inspired and influenced humankind;

4. by understanding the manner in which heritages and traditions of the past influence the direction and values of society.

I. Each learner will develop a positive attitude toward self demonstrated through:

1. a feeling of positive self-worth, security, and self-assurance;

2. a willingness to live with one's strengths and weaknesses;

3. a knowledge of one's own body and a positive attitude toward one's own physical appearance;

4. understanding that efforts to develop a better self contribute to the development of a better society;

5. understanding that self-concept is acquired by interaction with other people;

6. appropriate control or release of emotions.

J. In order to set and acquire personal goals, each learner will develop the ability:

1. to select appropriate personal learning goals;
2. to make decisions about one's life;
3. to plan, organize, and act to realize one's goals;
4. to accept responsibility for personal decisions and actions;
5. to work now for goals to be realized in the future;
6. to select viable alternatives for action in changing circumstances.

K. In order to cope with change, each learner will have the ability:

1. to initiate appropriate change while respecting existing structure and concepts;
2. to tolerate ambiguity;
3. to understand that coping with change is a lifelong process;
4. to understand and accept the changing nature of work and the potential need to change careers several times;
5. to use career information and counseling services to make informed and satisfying vocational choices.

L. In order to lead a healthy, fulfilling life, each learner will:

1. assume responsibility for one's own physical and mental health and safety by establishing a daily regime of positive health behaviors which will maintain mental and physical health, and motor fitness;
2. make informed decisions about health products and services;
3. make lifestyle decisions which promote healthful family living;
4. understand public health measures and their effect on the individual, family, community, and environment;
5. be able to enjoy play-skill activities which include understanding, cooperation, accepting rules, controlling emotions, following group process, and acquiring self-satisfaction.

M. In order to lead a productive life and actively contribute to the economic well being of our society, each learner will develop the work readiness skills:

1. of being able to apply the basic skills of communications, computation, and scientific principles to real life situations in a technological society;

2. of defining and interpreting the nature of the work force in terms of one's own challenges and opportunities;

3. of leadership and citizenship skills necessary to succeed as an active agent in a changing work force;

4. of understanding employment opportunities, job seeking and keeping skills, and specific work skills as they relate to transition from school to economic productivity;

5. of developing pride in good work and expecting quality in products and services;

6. of adopting a positive attitude toward work, including an acceptance of the necessity of making a living and an appreciation of the social value and dignity of work.

Chapter 2

Agriculture/Agribusiness Education

Introduction and Goals

CHAPTER II

AGRICULTURE/AGRIBUSINESS EDUCATION

Agriculture education is in a period of transition, moving to meet the needs of students in a highly scientific specialized industry.

Since its inception in 1917, vocational education in agriculture has undergone numerous transformations. Today, with less than four percent of the population involved in the production aspects of agriculture, the total agriculture/agribusiness industry continues to provide employment for approximately 25% of our nation's work force.

The prospect of diminishing opportunities for entrance into production agriculture caused significant changes in agriculture education originating with the 1963 Vocational Education Act and continuing with several other revisions. Current agriculture education programs are providing education relevant for many entering the food and fiber industry.

Today, the declining numbers of high school students, combined with the economic crisis impacting agriculture since 1983, required an adjustment of educational programs in agriculture to meet career opportunities in the food and fiber industry in the final decade of the twentieth century. Agricultural education must become more comprehensive in its mission to educate society in and about agriculture, encompassing both vocational and non-vocational programs.

In preparation for the twenty-first century, practitioners in agriculture education must be involved in the development of programs which will increase the public awareness of the need for agricultural education as a basic component in the educational system.

The Minnesota Department of Education, a recognized leader in educational reform, developed a Coordinated Model for Education Improvement[1] which lists the concerns expressed and issues addressed by the public, the Legislature, and reports published on the state of public education. The vehicle adopted by the Minnesota Department of Education for achieving educational reform is Outcome Based Education.

Implementing an Outcome Based Education model requires the utilization of a contemporary mission statement in each discipline. The mission of agriculture education is:

> To educate society in and about agriculture which will focus on serving the needs of the agricultural industry, the community (local, state, national, international), and all persons interested in and/or preparing for agricultural careers.(2)

Educational programs in agriculture shall ensure that individuals acquire knowledge in and about the agricultural industry, develop skills and positive attitudes toward themselves and others, to solve problems, think creatively, continue learning and develop their maximum potential for leading productive, fulfilling lives in a complex and changing society.(3)

The agriculture education program, based on a model program of study of two to four years, shall emphasize agriculturally-related technical subject matter, leadership, employability, career planning, and the application of acquired skills and knowledge through active learning experiences. The academic core is reinforced throughout by fully integrating skills in verbal and written communication, computation, and comprehension into all areas of the curriculum.

Figure One graphically depicts the interrelationships of the Agriculture Education program in secondary schools, the "core curriculum" of the secondary school, and the three domains in Bloom's Taxonomy of Educational Objectives.(4)

In any given agriculture program or activity a portion of the geometric grid (one block) will have commonalties with any of the core curriculum areas and any one of the three domains in Bloom's Taxonomy. Examining and being able to communicate the interrelationship to other teachers, administrators, and the public, can provide substance to the argument that agriculture education in the high school serves as a vehicle to help students recognize, transfer, and apply basic academic knowledge through practical application.

The fundamental purpose of Outcome Based Education is to equip all students with the competencies, knowledge, and awareness that enables them to lead successful lives following their schooling experience.(5)

This purpose reflects a philosophy that the desired outcome of schooling is: 1) the recognition that preparation for success in life, not merely success in school, is a primary purpose; and 2) this purpose applies to all students, not simply the academically inclined or "successful." Consequently, this purpose statement suggests that we re-examine both those things we expect students to be able to demonstrate when they leave high school and the curriculum which is driven by those expectations. The statement clearly implies that learner outcomes must prepare students for life in the long term, not just for short term success on the job or in college. It further implies that no students should be excluded from consideration when we define and pursue these goals.(6)

Chapter Three of this publication identifies the Exit Outcomes for agricultural education programs in Minnesota; that is, those things students should be able to demonstrate when they leave high school.

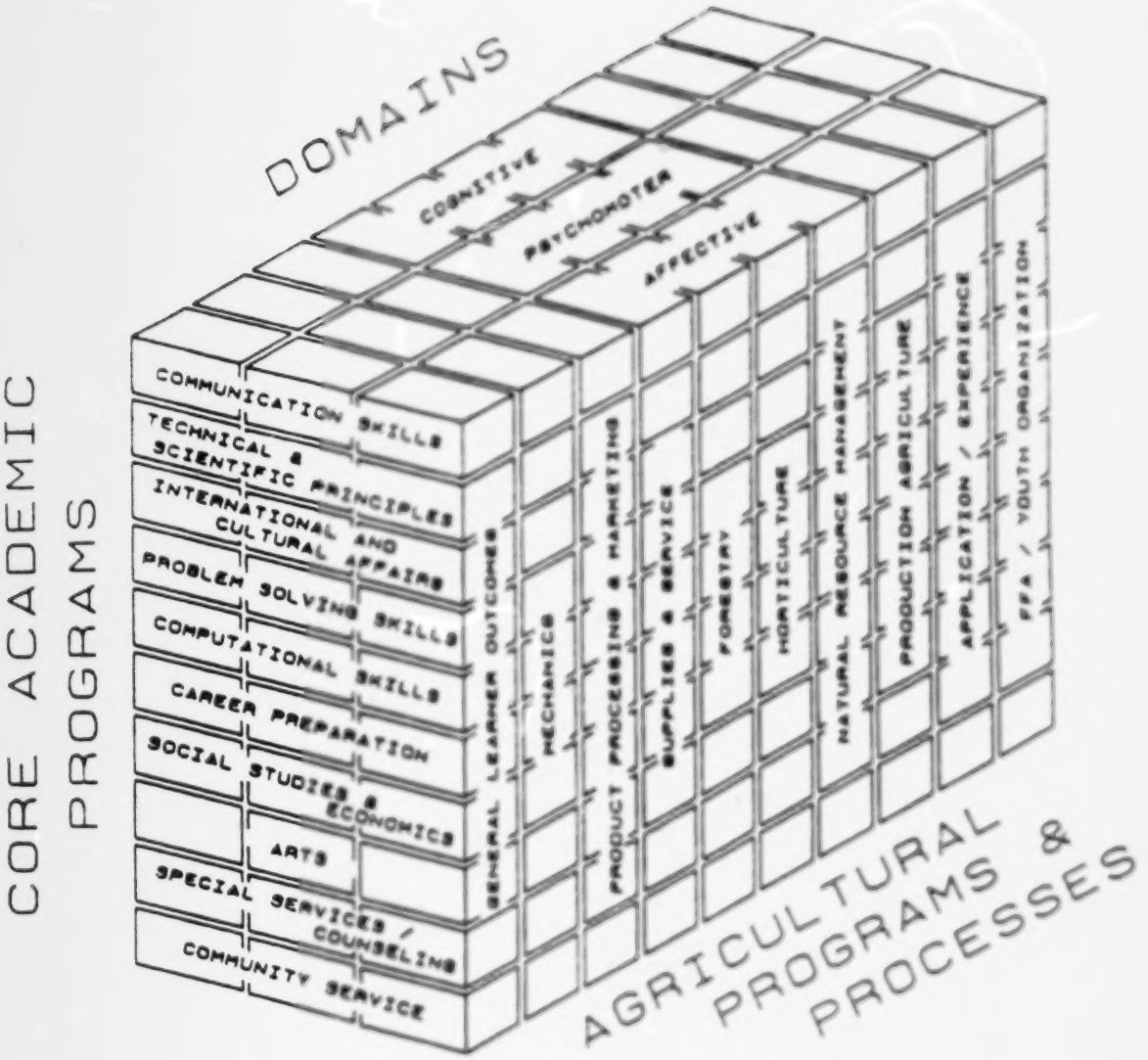


Figure One. The Interrelationship of Agricultural Education Programs in the Core Academic Program, the Domains of Learning and the Agriculture Programs and Processes in Secondary Schools

Each of these outcomes supports and/or contributes to the Minnesota State Board of Education Learner Goals, designed to prepare students to successfully deal with the contingencies of the remaining portion of the twentieth century, rather than just performing successfully in college or on the job.

Experts in Outcome Based Education, as agriculture educators since the inception of the program, are convinced that the higher order thinking, problem solving, and decision making skills are among the most important outcomes for students regardless of subject area or program of study.

An underling premise of Outcome Based Education and the learner outcomes presented in Chapter III of this document encompass three key premises:(4)

1. all students can learn and succeed;
2. success breeds success;
3. schools and teachers control the conditions of success.

The final premise requires that instructors plan and deliver instruction in different ways than is customary in most high schools today. Achieving this premise means transforming, not modifying, the way many teachers teach.

The two key principles of Outcome Based Education include: 1) Clarity of focus and expanded opportunity must be present for success. That is, the instructional organization, components and practices should be designed around clearly defined outcomes mutually agreeable to the program advisory committee, administration, and instructional staff; and 2) Schools and instructors must provide all students with the time and instruction needed to reach essential outcome goals.(6)

The program components of Outcome Based Education are no different than those in any other kinds of instructional systems and include:

1. curriculum content and structure;
2. an instructional delivery system;
3. a system for assessing student progress;
4. placing, grouping, and advancing students through a program.(6)

What differentiates the Outcome Based Educational model from other educational models is that the four components focus on, are defined by, and are organized around the identified outcomes students are expected to accomplish versus reliance on the clock, schedule, and calendar.

California initiated, in 1983, Model Curriculum Standards.(7) The State Department of Education summarized the new directions for career, vocational preparation in five succinct points which will be useful as Minnesota instructors implement Learner Outcomes for their programs:

1. Identification of an academic core necessary for all students to become successful and productive members of society.

2. The importance of agricultural education programs in reinforcing the academic core.

3. The need for high standards of measurable quality for agricultural programs.

4. Coordination of instruction within and among schools to ensure a sequential program is in place.

5. The responsibility for agricultural education to adapt to the "ever changing technology."

Implementation of the Learner Outcomes for Agricultural Education, as listed in Chapter III, shall continue to use a programmatic, problem solving approach, including a sequential learning system which incorporates a combination of instruction in leadership, agricultural subject matters, and experiential learning.

Additional outcomes should be identified by the local program advisory committee, instructional staff, administration, and Board of Education to serve the unique needs of their students. The process for implementing Learner Outcomes is discussed in Chapter V.

As students progress through the sequential program, emphasis will change from career awareness and exploration to real life, occupationally relevant experiences.

Interpersonal and employability skills will be taught through the intracurricular student organization (FFA) and an individualized supervised agricultural experience program. Specific learner outcomes in the curriculum will emphasize mastery of general occupational skills, including resumé development, letter writing, the ability to establish and to maintain positive relationships with employers and fellow employees. Opportunities to develop entrepreneurial programs and to apply the skills and knowledge learned will be available through an ever-expanding experiential program.

Conclusion...

The objectives for Learner Outcome Based Agricultural Education programs in Minnesota shall be to:

1. assist students in acquiring communications, computational, comprehension, interpersonal, and problem solving skills;

2. develop in students qualities of self-confidence, responsibility, values, ethics, leadership, citizenship, and cooperation through participation in activities of the FFA (student organization);

3. assist students in becoming knowledgeable of the economic contributions of the agricultural industry, understand the American free enterprise system and the role of American agriculture in the international community;

4. provide an opportunity for students to demonstrate a comprehension of the basic scientific principles involved in technical agriculture.

Chapter 3

Agriculture/Agribusiness Education

Model Learner Outcomes

CHAPTER III

DEVELOPING MODEL LEARNER OUTCOMES AND ASSESSMENT FOR AGRICULTURAL EDUCATION

The purpose of this chapter is to provide agricultural education personnel with a list of learner outcomes that a student should be able to demonstrate as a result of participating in a Grade 9 through 12 agricultural program.

This chapter contains only the broad categories of learner outcomes for an agricultural education. The list of outcomes in this chapter are broad and require curriculum development before the instruction and evaluation processes begin.

This chapter will also indicate how each program area of learner outcomes reflects the State Board of Education goals and how they are related to the broad agriculture program goals and objectives. The objectives are classified according to cognitive, affective, and psychomotor domains. International, multicultural, and gender fair concept development are also included.

The first section of this chapter, "General Learner Outcomes for all Agricultural Education Program Areas," contains those outcomes the committee has found to be common to all programs and strongly suggests that they be the core learner outcomes for all program areas in agriculture.

Because of the current emphasis on higher order thinking, the next few pages will review a few of the methods for labeling higher order thinking skills.

It must be remembered that the higher order thinking skills, "involvement learning," is where the "directing" of learning shifts from the teacher to the learner and the teacher plays a consulting role. When students are expected to apply learning, teachers need to reduce the amount of material to be investigated during the course or unit.

Public education in general, and vocational education in particular, have been on the firing line during the past few years. National reports, the press, and the public have been critical of schools. This attention may not have been entirely unwarranted and, at the same time, may have caused education to be "THE TOPIC" for discussion by lay people and created a "new agenda" for school improvement through some critical evaluation and planning by us, the professionals in the field.

One area where education has been criticized the most was for not teaching enough in the area of "higher level learning skills." Benjamin S. Bloom (1956), a respected educator and prolific author in the area of taxonomy of educational goals and student learning, has classified learning into three domains - cognitive, affective, and psychomotor.

Many people, including some leaders in education, feel that vocational education, of which agriculture education is a part, is primarily psychomotor training. While agriculture education does use this domain of manipulative or motor skill learning for a portion of its learning activities, it is not exclusive to the discipline. Art, sports, handwriting, music, industrial arts, drama, and physical education also provide learning in the psychomotor domain. More noteworthy, good vocational education in agriculture has utilized the other two domains extensively.

The affective domain, which includes objectives that describe changes in interest, attitudes and values, and the development of appreciations, is also an integral part of vocational education's teaching/learning outcomes.

The cognitive domain includes those objectives which deal with the recall or recognition of knowledge and the development of intellectual abilities and skills. It is in this domain that most of the work in curriculum development has taken place and where the clearest definition of objectives are to be found. On the following pages is a summary list of Bloom's taxonomy of educational objectives in the cognitive domain with specific examples of learner outcomes included.

The jury is still out on the question of the amount of instructional time that should be devoted to each of the six levels of Bloom's Taxonomy of Educational Objectives (1956). It appears that many professionals and teacher trainers agree that because of the necessary "building block" effect of first knowledge, then comprehension, application, analysis, synthesis, and finally evaluation, that most of the instructional time must take place in the first three levels. Roger Taylor,(8) in his information and presentations on learning and gifted education, suggests that the following allotment of time be used as a guide:

Cognitive Level	Percent of Teaching
Knowledge	30%
Comprehension	30%
Application	30%
Analysis/Synthesis/Evaluation	10%

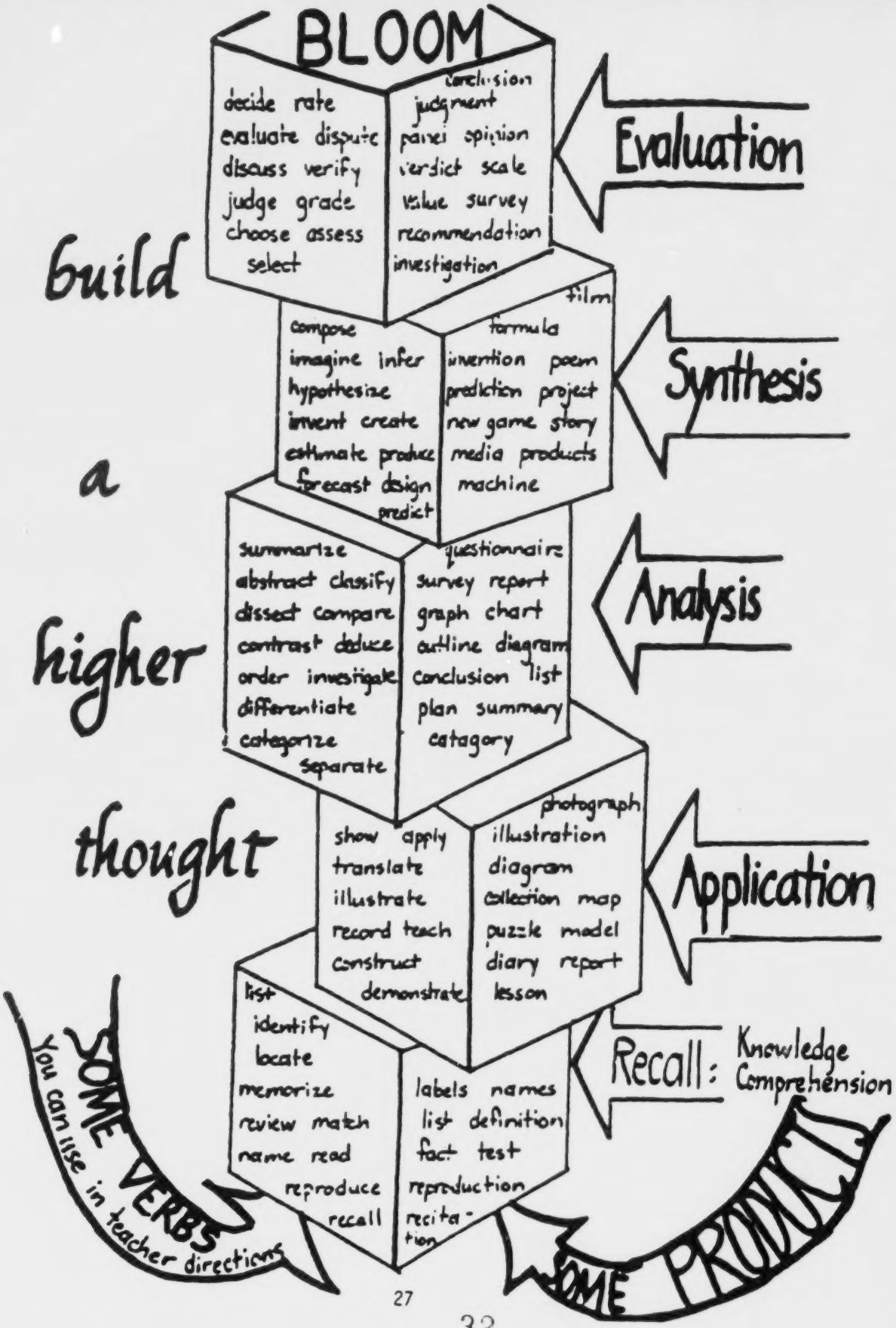
The higher order learning outcomes are critical in developing a problem solving, responsible leader in society, but the basics must be learned and applied before a student or teacher should attempt analysis, synthesis or evaluation. This statement should not be mistakenly interpreted to mean that all students must be "masters" of basic skills before becoming involved in higher-order thinking. The application and transfer of basic skills from other "regular education" courses, to high order thinking outcomes in agriculture, may be the avenue best suited to develop a "mastery" of basic skills in the student.

EXAMPLES OF LEARNER OUTCOMES FOR THE COGNITIVE DOMAIN OF THE TAXONOMY

Stating Learner Outcomes for Classroom Instruction

Major Categories in the Cognitive Domain of the Taxonomy of Educational Objectives (Bloom, 1956)	Illustrative Learner Outcomes	Illustrative Terms for Stating Specific Learned Outcomes
1. KNOWLEDGE. Knowledge is defined as the remembering of previously learned material. This may involve the recall of a wide range of material, from specific facts to complete the theories, but all that is required in the bringing to mind of the appropriate information. Knowledge represents the lowest level of learning outcomes in the cognitive domain.	Knows common terms Knows specific facts Knows methods and procedures Knows basic concepts Knows principles	Defines, describes, identifies labels, lists, matches names, outlines, reproduces, selects, states
2. COMPREHENSION. Comprehension is defined as the ability to grasp the meaning of material. This may be shown by translating material from one form to another (words to numbers), by interpreting material (explaining or summarizing), and by estimating future trends (predicting consequences or efforts). These learning outcomes go one step beyond the simple remembering of material, and represent the lowest level of understanding.	Understands facts and principles Interprets verbal material Interprets charts and graphs Translates verbal material to mathematical formulas Estimates future consequences implied in data Justifies methods and procedures	Converts, defends, distinguishes, estimates, explains, extends, generalizes, gives examples, infers, paraphrases, predicts, rewrites, summarizes
3. APPLICATION. Application refers to the ability to use learned material in new and concrete situations. This may include the application of such things as rules, methods, concepts, principles, laws, and theories. Learning outcomes in this area require a higher level of understanding than those under comprehension.	Applies concepts and principles to new situations Applies laws and theories to practical situations Solves mathematical problems Constructs charts and graphs Demonstrates correct usage of a method or procedure	Changes, computes, demonstrates, discovers, manipulates, modifies, operates, predicts, prepares, produces, relates, shows, solves, uses

4. ANALYSIS. Analysis refers to the ability to break down material into its component parts so that its organizational structure may be understood. This may include the identification of the parts, analysis of the relationships between parts, and recognition of the organizational principles involved. Learning outcomes here represent a higher intellectual level than comprehension and application because they require an understanding of both the content and the structural form of the material.	Recognizes unstated assumptions Recognizes logical fallacies in reasoning Distinguishes between facts and inferences Evaluates the relevancy of data Analyzes the organizational structure of a work, plan, or specimen	Breaks down, diagrams, differentuates, discriminates, distinguishes, identifies, infers, outlines, points out, relates, selects, separates, subdivides
5. SYNTHESIS. Synthesis refers to the ability to put parts together to form a new whole. This may involve the production of a unique communication (theme or speech), a plan of operations (research proposal) or set of abstract relations (scheme for classifying information). Learning outcomes in this area stress creative behaviors, with major emphasis on the formulation of new patterns or structures.	Writes a well-organized theme Gives a well-organized speech Writes a creative short story (or poem, or music) Proposes a plan for an experiment Integrates learning from different areas into a plan for solving a problem Formulates a new scheme for classifying objects (or events, or ideas)	Categorizes, combines, compiles, composes, creates, devises, assigns, explains, generates, modifies, organizes, plans, rearranges, reconstructs, relates, reorganizes, revises, rewrites, summarizes, tells, writes
6. EVALUATION. Evaluation is concerned with the ability to judge the value of material (statement, novel, poem, research report) for a given purpose. The judgments are to be based on definite criteria. These may be internal (organization) or external criteria (relevant to the purpose), and the student may determine the criteria or be given them Learning outcomes in this area are highest in the cognitive hierarchy because they contain elements of all of the other categories, plus conscious value judgments based on clearly defined criteria	Judges the logical consistency of written material Judges the adequacy with which conclusions are supported by data Judges the value of a work, plan, or specimen by use of internal criteria Judges the value of work, plan, or specimen by use of external standards of excellence	Appraises, compares, concludes, contrasts, criticizes, describes, discriminates, explains, justifies, interprets, relates, summarizes, supports


BLOOM
build a higher thought
decide rate evaluate dispute discuss verify judge grade choose assess select
conclusion judgment panel opinion verdict scale value survey recommendation investigation
Evaluation
compose imagine infer hypothesize invent create estimate produce forecast design predict
formula film invention poem prediction project new game story media products machine
Synthesis
summarize abstract classify dissect compare contrast deduce order investigate differentiate categorize separate
questionnaire survey report graph chart outline diagram conclusion list plan summary catagory
Analysis
show apply translate illustrate record teach construct demonstrate
photograph illustration diagram collection map puzzle model diary report lesson
Application
list identify locate memorize review match name read reproduce recall
labels names list definition fact test reproduction recita-tion
Recall: Knowledge Comprehension
SOME VERBS You can use in teacher directions
SOME PRODUCTS

The model learner outcomes included on the following pages represent a set of possible and valuable end results of instruction in agriculture. Included in the agriculture model learner outcomes are those specified by the State Board of Education as essential outcomes.

These are the General Learner Outcomes for Agriculture and are underlined in this chapter. The essential outcomes are central to the understanding of the subject, of lifelong importance to the learners, and, according to the PER legislation, must be incorporated into each district's testing of agriculture learner outcomes.

Each learner outcome corresponds to one or more of the State Board of Education Learner Goals identified in Chapter I. The outcomes are also referenced to the cognitive [knowledge, application, integration (analysis, synthesis, evaluation)], psychomotor, and affective development domains. Outcomes that focus on multicultural, gender-fair, and international/global concept development are coded to indicate this emphasis. In future versions of this document, the learner outcomes will be keyed to items for agriculture education in the Minnesota Department of Education Test Item Bank.

Chapter IV describes how to transpose these learner outcomes into a local district curriculum.

MODEL LEARNER OUTCOMES FOR AGRICULTURE/AGRIBUSINESS EDUCATION

SBE LEARNER GOALS	LEARNER OUTCOMES	DEVELOPMENT AND CONCEPT EMPHASIS

GENERAL LEARNER OUTCOMES FOR ALL AGRICULTURE EDUCATION PROGRAM AREAS

The students will demonstrate that they can:

A, B-3, C

I. Engage in traditional and innovative approaches to problem recognition and analysis in agriculture.

- A. Assess problems by identifying discrepancies between beliefs, values, and reality. — Integration
- B. Outline problem characteristics in regard to level of significance, practicality, multi-dimensional type, and duration of time. — Knowledge
- C. Engage in problem solving by identifying alternative solutions and formulating and reaching decisions logically. — Integration
- D. Demonstrate the scientific method in problem solving. — Application
- E. Evaluate the short and long term effects of the proposed decision. — Integration

A, B-1, B-5, B-9, B-11, B-12, F, I, J, M

II. Apply basic academic and specific agricultural occupation skills through occupational experience models such as independent study, career exploration, simulated or paid occupational experiences or entrepreneurship programs.

- A. Describe the relationship between agriculture in the classroom and the individualized occupational experiences of the student. — Knowledge
- B. Plan and implement a personal occupational experience. — Application
- C. Demonstrate goal setting, record keeping, budgeting, and accounting skills relating to the personal occupational experience. — Application

A, B-2, B-3, B-5, D, E, F, G, I, J, L-5, M

III. Demonstrate the leadership and human relations skills necessary to become a productive member of society with a positive feeling of self-worth through classroom instruction and integral activities of the FFA and/or

SBE LEARNER GOALS	LEARNER OUTCOMES	DEVELOPMENT AND CONCEPT EMPHASIS

GENERAL LEARNER OUTCOMES FOR ALL AGRICULTURE EDUCATION PROGRAM AREAS

The students will demonstrate that they can (Con'd.):

agriculturally related youth organizations.

	A. Demonstrate respect for the opinions, customs and individual differences of others including acceptance of people from other cultures.	Application/ International/ Global/Multi-cultural/ Gender Fair
	B. Offer and accept criticism constructively.	
	C. Demonstrate the ability to work with or without supervision.	Application
	D. Describe the need for organization, supervision, rules, policies, and procedures.	Knowledge
	E. Demonstrate appropriate procedures for conducting a business meeting.	Application
	F. Develop an appreciation for the value of academic and related skill competition.	Affective
A, B-2, B-3, B-4, B-7, B-14, D, E, F, H	IV. Develop and explain a personal philosophy about the importance of the economic and social values of agriculture as an industry and a force in a global society from a historical, current and future perspective.	
	A. Identify and interpret the effects of world cultural habits on agricultural product consumption.	International/ Global/Know-ledge/Multi-cultural/Gender Fair
	B. Discuss the effects of natural disaster and internal or international conflicts on macro-economics.	Knowledge
	C. Discuss world hunger problems and the strengths and weaknesses of past and present food distribution, programs.	Integration
A, C, E-1, E-2, E-3, F	V. Explain the economic and social impacts of decision-making in agriculture with special emphasis on the local socio-economic community. Demonstrate the following decision-making process:	

SBE LEARNER GOALS	LEARNER OUTCOMES	DEVELOPMENT AND CONCEPT EMPHASIS

GENERAL LEARNER OUTCOMES FOR ALL AGRICULTURE EDUCATION PROGRAM AREAS

The students will demonstrate that they can (Con'd.):

	A. Determine available alternatives for accomplishing change.	Knowledge
	B. Determine ways and resources for achieving alternatives.	Knowledge
	C. Assess consequences associated with proposed solutions to self and others.	Integration
	D. Make a reasoned judgment.	Integration
	E. Develop an action plan.	Application
	F. Predict the social and economic impact of the decision.	Integration
A, B-2, B-3, B-4, B-5, B-6, B-10, B-14, F	VI. Investigate, explain and apply the concept that agricultural marketing involves the production, distribution, promotion and pricing of agricultural products in the free enterprise system in such a way as to satisfy customer needs in a profitable manner.	
	A. Understand and apply basic economic concepts.	Application
	B. Investigate and understand contemporary marketing philosophies.	Knowledge
	C. Understand the effects of the commodity marketing tools available to agriculture.	Knowledge
	D. Understand and apply sales management skills.	Application
	E. Understand the effect of international trade.	Knowledge
A, B-1, B-9, B-10, B-11, I, J, K, M	VII. Identify, analyze and appreciate the important aspects of existing occupations in agriculture while predicting opportunities available in agricultural occupations and developing those skills necessary to attain and retain careers of choice.	
	A. List and compare agriculturally related occupations.	Knowledge

SBE LEARNER GOALS	LEARNER OUTCOMES	DEVELOPMENT AND CONCEPT EMPHASIS

GENERAL LEARNER OUTCOMES FOR ALL AGRICULTURE EDUCATION PROGRAM AREAS

The students will demonstrate that they can (Con'd.):

	B. List and discuss the skills, knowledge and training required for various occupations.	Knowledge
	C. Understand the necessity of "life-long learning" in order to retain or advance in an occupation.	Knowledge
	D. Demonstrate the leadership, employability, communications and human relations skills necessary for employment and advancement.	Application
A, M-1	VIII. Recognize, transfer and apply basic academic knowledge through practical applications in agriculture.	
	A. Apply reading skills.	
	1. appreciate the purposes of written material.	Affective
	2. use references.	Application
	3. note details and facts.	Application
	4. identify and summarize ideas.	Knowledge
	5. verify, evaluate and interpret written materials.	Integration
	B. Apply computational skills.	
	1. apply basic mathematics and use ratios, proportions, percentages and simple algebraic equations.	Application
	2. calculate measurements.	Application
	3. estimate costs, time and resources in task analysis.	Application
	4. compute interest.	Application
	5. gain a working knowledge of and appreciate the benefits of understanding probability and statistics.	Affective/ Knowledge

SBE LEARNER GOALS	LEARNER OUTCOMES	DEVELOPMENT AND CONCEPT EMPHASIS

GENERAL LEARNER OUTCOMES FOR ALL AGRICULTURE EDUCATION PROGRAM AREAS

The students will demonstrate that they can (Con'd.):

		6. interpret charts, graphs and tables.	Application
		C. Demonstrate technical and scientific principles.	
		1. apply chemical, physical and biological principles.	Application
		2. demonstrate computer word processing, data base management and electronic spread sheets.	Application
		3. record observations.	Application
		4. record and maintain financial data and other necessary information.	Application
		D. Demonstrate communication skills.	
		1. apply listening skills.	Application
		2. apply writing skills.	Application
		3. apply speaking skills.	Application
A	IX.	Identify, examine, understand and apply the current mechanical technologies in energy, power and construction being utilized in the production, housing, storage, processing and transportation of agricultural products specific to the program area being studied.	Application/ Knowledge
A, B-2, B-3, B-4, B-5, B-6, B-7, B-10, D, F	X.	Evaluate the role of agriculture in a changing environment, including the need to maintain the world's ecosystem.	
		A. Develop an integrated view of the environment.	Integration
		B. Develop an understanding of the interdependence of all aspects of the environment and that this knowledge is essential to making appropriate decisions in natural resource management.	Integration

SBE LEARNER GOALS	LEARNER OUTCOMES	DEVELOPMENT AND CONCEPT EMPHASIS

GENERAL LEARNER OUTCOMES FOR ALL AGRICULTURE EDUCATION PROGRAM AREAS

The students will demonstrate that they can (Con'd.):

		C. Identify problems confronting human life as the finite amounts of nonrenewable resources become depleted and the areas for production of renewable natural resources become limited in the world.	Knowledge
A, C	XI.	Recognize, create, maintain and value a safe environment for both work and leisure.	Application/ Integration/

SBE LEARNER GOALS	LEARNER OUTCOMES	DEVELOPMENT AND CONCEPT EMPHASIS

AGRICULTURAL MECHANICS OCCUPATIONS

The students will demonstrate that they can:

A, C	I. Compare, select and apply the appropriate source of agricultural power while operating, maintaining and repairing power units, including both tractors and small engines.	
	A. Outline the safety rules to follow when servicing, operating, transporting and storing power units.	Knowledge
	B. Interpret operators' manuals and parts' manuals including systems, circuits and flow charts while ordering parts and performing recommended service and maintenance practices.	Integration/ Psychomotor
	C. Match the appropriate power sources to specific situations including ballasting and weighting of tractors.	Application
	D. Describe how energy is transformed into power while identifying the functions and operating principles of clutches, transmissions, brakes and controls.	Knowledge
	E. Examine, describe and demonstrate how the technology of computers, electronics, controls, sensors and hydraulics are incorporated into agricultural power units.	Application/ Psychomotor
	F. Test, analyze, maintain and perform recommended services and repairs to power units.	Application/ Psychomotor
	G. Compare the economics of ownership, lease, rental and custom agreements.	Integration
	H. Discuss finance and insurance factors relating to agricultural power sources.	Knowledge
A, C	II. Compare and select the appropriate agricultural machinery and equipment while operating, maintaining and repairing selected equipment.	
	A. Outline the safety rules to follow when servicing, operating, transporting and storing machinery.	Application

AGRICULTURAL MECHANICS OCCUPATIONS

The students will demonstrate that they can (Con'd.):

	B.	Interpret operators' manuals and parts' manuals, including systems, circuits and flow charts while ordering parts and performing recommended service and maintenance practices.	Integration/ Psychomotor
	C.	Match the appropriate machinery and equipment to an appropriate power source for a specific purpose and to calibrate all machines for planting and field crop treatments.	Application/ Psychomotor
	D.	Examine, describe and demonstrate how the technology of computers, electronics, controls, sensors and hydraulics are incorporated into agricultural machinery.	Application/ Psychomotor
	E.	Test, analyze, maintain and perform recommended services and repairs to agricultural machinery.	Application/ Psychomotor
	F.	Compare the economics of ownership, lease, rental and custom agreements.	Application
	G.	Discuss finance and insurance factors relating to agricultural machinery.	Knowledge
A, C	III.	Compare and apply appropriate criteria in selecting and constructing agricultural structures.	
	A.	Interpret and explain site selection criteria.	Integration
	B.	Examine and describe permits, codes, local limitations and appropriate designs for the geographic area.	Knowledge
	C.	Draw and interpret blueprints, select materials, develop a bill of materials, select contractors and discuss warranties on a selected building.	Application
	D.	Identify and explain the environmental factors and controls required for humidity, temperature, light, ventilation, sanitation and water supplies, along with materials-handling components of an agricultural structure.	Knowledge

SBE LEARNER GOALS	LEARNER OUTCOMES	DEVELOPMENT AND CONCEPT EMPHASIS

AGRICULTURAL MECHANICS OCCUPATIONS

The students will demonstrate that they can (Con'd.):

	E. Construct a building or participate in an activity related to agricultural construction.	Application/ Psychomotor
	F. Discuss finance and insurance factors relating to agricultural structures.	Knowledge
	G. Outline the safety rules to follow when using tools for construction of agricultural structures plus the safety precautions required in the installation of heat, light and ventilation for crop and livestock structures.	Knowledge
A, C	IV. Compare, select and install safe electrical circuits, electrical power, and electric control/sensing devices.	
	A. Identify and practice safe operating practices considering local standards, codes and OSHA criteria.	Knowledge
	B. Design safe circuits, select appropriate materials while wiring and installing service entrances, circuits, switching devices, appliances and ground fault circuit interruptors.	Integration/ Psychomotor
	C. Describe how computers are used in electrical, electronic and control/sensing devices.	Knowledge
	D. Select, interpret name plate data, and service electric motors while interpreting Horsepower, pf, torque and other use criteria.	Integration
	E. Identify and describe the basic principles of controls, including thermostats, humidistats, photo-electric, magnetic relays, programable controllers, sensors, ultrasonic, timers, and pressure and limit switches while selecting and installing appropriate controls or sensing devices for automatic systems.	Application/ Knowledge/ Psychomotor

SBE LEARNER GOALS	LEARNER OUTCOMES	DEVELOPMENT AND CONCEPT EMPHASIS

AGRICULTURAL MECHANICS OCCUPATIONS

The students will demonstrate that they can (Con'd.):

A, C	V. Examine the value of and demonstrate the necessary skills required in arc welding, oxy-fuel welding, brazing, and cutting.	
	A. Identify safety practices used in welding and cutting.	Knowledge
	B. Compare and contrast the commonly used welding and cutting units available for metal fusion, brazing, and cutting.	Knowledge
	C. Examine and understand metallurgy technology which includes metal selection, heat treatment, and control of distortion.	Knowledge
	D. Perform those skills used in welding repair and fabrication.	Application/ Psychomotor
A, B-6, B-7, C	VI. Compare, select and apply appropriate soil and water management practices including conservation, cultivation, erosion, sedimentation, impoundment, drainage, land and water use, fertility, measurement, and irrigation practices including plant and soil analysis.	
	A. Draw, read and interpret maps and surveys.	Application/ Integration
	B. Describe principles and practices involved in appropriate land use and conservation.	Knowledge
	C. Describe and use surveying instruments to determine needs, describe and record information, and layout approved practices for land use and conservation.	Application/ Psychomotor
	D. Use surveying instruments to demonstrate the layout of building footings, foundations, and elevations.	Application/ Psychomotor
	E. Examine, describe, layout, and demonstrate various irrigation systems along with the computer and sensor technology used to analyze plants and soil needs to provide automatic "on-the-go" variations in nutrients and/or water.	Application/ Psychomotor

AGRICULTURAL MECHANICS OCCUPATIONS

The students will demonstrate that they can (Con'd.):

	F. Examine, describe, and demonstrate those computers and sensors available to analyze soil to provide "on-the-go" variations in plant populations, nutrient, and pesticide amounts at planting time.	Application/ Psychomotor
A, C	VII. Compare and describe hydraulic components while demonstrating that hydraulics and pneumatics serve as muscles in mechanical motion.	
	A. Recognize and apply the mechanical advantage of hydraulic power.	Application
	B. Understand and relate the role of hydraulic pumps, motors, and systems in fluid power.	Knowledge
	C. Maintain, analyze malfunctions in, and make approved repairs to hydraulic systems.	Application/ Psychomotor
	D. Select and apply the appropriate hydraulic units for specific mechanical uses in agricultural construction.	Application
	E. Identify and practice safe operating practices.	Application/ Psychomotor
A, C	VIII. Examine the characteristics of and select the appropriate materials to be used in fabrication.	
	A. Identify and practice safe operating procedures for use of tools and the assembly processes.	Application/ Psychomotor
	B. Analyze the functions of metal, wood, plastic, fiberglass, and concrete in fabrication.	Integration
	C. Plan, design, and construct projects using appropriate materials for fabrication.	Integration/ Psychomotor
	D. Demonstrate the appropriate use of fasteners, adhesives, and fusion welding used in fabrication.	Application/ Psychomotor
A, C	IX. Identify, compare, and select appropriate material handling equipment, vehicles, structures, and buildings.	

SBE LEARNER GOALS	LEARNER OUTCOMES	DEVELOPMENT AND CONCEPT EMPHASIS

AGRICULTURAL MECHANICS OCCUPATIONS

The students will demonstrate that they can (Con'd.):

	A. Identify and practice safe operating procedures for use with mechanical equipment.	Application/ Psychomotor
	B. Identify, compare, and determine the technology used in transfer of power in the materials handling process, including gears, chains, sprockets, pneumatics and fluid power; and both electrical and combustion engine power sources.	Integration
	C. Explain the function and operating principles of grain drying, moving of grain, storage, and processing.	Knowledge
	D. Explain the function and operating principles of wagons, augers, blowers, conveyors, elevators, and transportation systems used in materials handling.	Knowledge
A, C	X. Identify needs, select equipment, plan, design, and construct a modern agricultural equipment repair maintenance and storage facility.	
	A. Identify and incorporate safe operating procedures.	Application/ Psychomotor
	B. Use a simulation problem to design a repair and maintenance facility for a modern farm or agribusiness.	Integration/ Psychomotor
A, C	XI. Identify the components of modern agricultural mechanical robotic technology including the transfer and application of mathematical and scientific knowledge.	
	A. Recognize that the computer serves as the "brain" in mechanical technology.	Knowledge
	B. Recognize that electronics and electrical controls in mechanics are synonomous with a nervous system in animals.	Knowledge
	C. Recognize that sensors serve to alert the computers of change.	Knowledge

SBE LEARNER GOALS	LEARNER OUTCOMES	DEVELOPMENT AND CONCEPT EMPHASIS

AGRICULTURAL MECHANICS OCCUPATIONS

The students will demonstrate that they can (Con'd.):

D.	Recognize that hydraulics and other forms of mechanical energy serve as the muscle for movement of robots, products, and machinery components.	Knowledge

SBE LEARNER GOALS	LEARNER OUTCOMES	DEVELOPMENT AND CONCEPT EMPHASIS

AGRICULTURAL PRODUCTS PROCESSING AND MARKETING OCCUPATIONS

The students will demonstrate that they can:

In addition to the following learner outcomes in **Agriculture Products: Processing and Marketing Occupations** the students must also have the learner outcomes in **Agricultural Sales and Service Occupations** included in the curriculum for this area.

A, B-2, B-3, B-4, B-5, B-14, C, E	I. Examine, analyze, describe, and relate the meat processing industry to each of the following:	
	A. Interpret and apply federal grading standards and regulations.	Application
	B. Using preestablished criteria, evaluate, judge, and classify meat products.	Integration
	C. Understand American and International meat consumption habits.	Knowledge
	D. Analyze and evaluate the effects of voluntary or mandated "check-off" procedures in agriculture product marketing.	Integration
	E. Develop a "value-added" model for processed materials.	Integration
	F. Examine and explain international trade, quotas and tariffs.	International/ Global/Knowledge/Multicultural/Gender Fair
	G. Develop an appreciation for cross-cultural communications in marketing of products and international trade.	Affective International/ Global/Knowledge/Multicultural/Gender Fair
A, B-2, B-14, C, E	II. Examine, analyze, describe, and relate the dairy processing industry to each of the following:	

SBE LEARNER GOALS	LEARNER OUTCOMES	DEVELOPMENT AND CONCEPT EMPHASIS

AGRICULTURAL PRODUCTS PROCESSING AND MARKETING OCCUPATIONS

The students will demonstrate that they can (Con'd.):

	A. Interpret and apply federal grading standards and regulations.	Integration
	B. Using preestablished criteria, evaluate, judge, and classify dairy products.	Integration
	C. Understand American and International dairy product consumption habits.	International/ Global/Knowledge
	D. Analyze and evaluate the effectiveness of voluntary or mandated "check-off" procedures in dairy product marketing.	Integration
	E. Develop a "value-added" model for dairy processed materials.	Integration
	F. Examine and explain international trade, quotas and tariffs.	International/ Global/Knowledge
	G. Develop an appreciation for cross-cultural communications in marketing of products and international trade.	Affective/ International/ Global/Knowledge
A, B-2, B-14, C, E	III. Examine, analyze, describe, and relate the poultry processing industry to each of the following:	
	A. Interpret and apply federal grading standards and regulations.	Integration
	B. Using preestablished criteria, evaluate, judge, and classify poultry products.	Integration
	C. Understand American and International food consumption habits as it relates to the poultry processing industry.	International/ Global/Knowledge
	D. Analyze and evaluate the effectiveness of voluntary or mandated "check-off" procedures in poultry product marketing.	Integration
	E. Develop a "value-added" model for processed materials in poultry.	Integration

SBE LEARNER GOALS	LEARNER OUTCOMES	DEVELOPMENT AND CONCEPT EMPHASIS

AGRICULTURAL PRODUCTS PROCESSING AND MARKETING OCCUPATIONS

The students will demonstrate that they can (Con'd.):

	F. Examine and explain international trade, quotas, and tariffs.	International/ Global/Knowledge
	G. Develop an appreciation for cross-cultural communications in marketing of products in international trade.	Affective/ International/ Global/Knowledge
A, B-2, B-14, C, E	IV. Examine, analyze, describe, and relate the grain processing industry to each of the following:	
	A. Interpret and apply federal grading standards and regulations.	Integration
	B. Using preestablished criteria, evaluate, judge, and classify grain products.	Integration
	C. Understand the American and International grain product consumption habits.	International/ Global/Knowledge
	D. Analyze and evaluate the effectiveness of voluntary or mandated "check-off" procedures in grain marketing.	Integration
	E. Develop a "value-added" model for processed grain materials.	Integration
	F. Examine and explain International trade, quotas, and tariffs, as it relates to grain marketing.	International/ Global/Knowledge
	G. Develop an appreciation for cross-cultural communications in marketing of grain products in International trade.	Affective/ International/ Global/Knowledge
A, B-2, B-14, C, E	V. Examine, analyze, describe, and relate the vegetable and fruit processing industries to each of the following:	
	A. Interpret and apply federal grading standards and regulations.	Integration

SBE LEARNER GOALS	LEARNER OUTCOMES	DEVELOPMENT AND CONCEPT EMPHASIS

AGRICULTURAL PRODUCTS PROCESSING AND MARKETING OCCUPATIONS

The students will demonstrate that they can (Con'd.):

		B. Using preestablished criteria, evaluate, judge, and classify fruit and vegetable products.	Integration
		C. Understand the American and International vegetable and fruit consumption habits.	International/ Global/Knowledge
		D. Analyze and evaluate the effectiveness of voluntary and mandated "check-off" procedures in fruit and vegetable product marketing.	Integration
		E. Develop a "value-added" model for processed vegetable and fruit materials.	Integration
		F. Examine and explain International trade, quotas and tariffs.	International/ Global/Knowledge
		G. Develop an appreciation for cross-cultural communications in marketing of products and International trade.	Affective/ International/ Global/Knowledge
A, B-2, B-14, C, E	VI.	Examine, analyze, describe, and relate the forest product processing industry to each of the following:	
		A. Interpret and apply federal grading standards and regulations.	Integration
		B. Using preestablished criteria, evaluate, judge, and classify forest products.	Integration
		C. Develop a "value-added" model for forest products.	Integration
		D. Examine and explain International trade, quotas, and tariffs.	International/ Global/Knowledge
		E. Develop an appreciation for cross-cultural communications in marketing of forestry products in International trade.	Affective/ International/ Global/Knowledge

SBE LEARNER GOALS	LEARNER OUTCOMES	DEVELOPMENT AND CONCEPT EMPHASIS

AGRICULTURAL SUPPLIES AND SERVICE OCCUPATIONS

The students will demonstrate that they can:

A, B-2, B-5, C, D-2	I. Identify and understand the management structures of, explain the role, importance and effect of, develop an appreciation for, and become familiar with the primary management activities of agribusiness in the free enterprise system.	
	A. Explain the effect of agriculture within the American economy.	Application Knowledge
	B. Compare and contrast agribusiness management structures.	Knowledge
	C. Identify and explain agribusiness management and operational activities.	Knowledge
	D. Investigate and discuss the concept of starting an agribusiness.	Knowledge
A, B-5, C	II. While using a given model, develop an appreciation for, recognize the importance of, and apply the financial and legal competencies required to manage or operate an agribusiness.	
	A. Outline insurance requirements for a business.	Knowledge
	B. Outline a plan for understanding tax management.	Knowledge
	C. Develop a budget for a business.	Application
	D. Develop an understanding of financial management.	Knowledge
	E. Discuss the need for credit and financing in business operation.	Knowledge
	F. Identify related business law.	Knowledge
	G. Select appropriate computer applications for business financing.	Application
A, C	III. Compare and explain the marketing functions in agribusiness and understand the economic forces involved in commodity marketing.	

SBE LEARNER GOALS	LEARNER OUTCOMES	DEVELOPMENT AND CONCEPT EMPHASIS

AGRICULTURAL SUPPLIES AND SERVICE OCCUPATIONS

The students will demonstrate that they can (Con'd.):

	A. Outline and discuss the economic function and channels used in agribusiness marketing.	Knowledge
	B. Compare and explain the methods used to transport agricultural commodities.	Knowledge
	C. Develop a plan for livestock and grain commodity marketing.	Application
	D. Identify and discuss agribusiness marketing agencies.	Knowledge
A, B-5, D-1, D-2	IV. Demonstrate the sales and marketing skills, techniques, and knowledge needed to successfully perform in a wholesale/retail sales position.	
	A. Recognize and appreciate the significance of the unique knowledge base needed to successfully sell in agriculture.	Affective/ Knowledge
	B. Demonstrate the basic sales skills needed to successfully initiate and close a sale.	Application
A, B-5, C, D-1, D-2, D-3	V. Demonstrate those standardized and technologically current business procedures and practices needed to successfully perform as an agribusiness employee while analyzing and developing the additional competencies required for management and/or owner-operator.	
	A. Demonstrate business procedures and record keeping methods including cash and credit transactions, inventory, and pricing.	Application/ Knowledge
	B. Have a knowledge of and apply record keeping skills including sales and purchase records.	Application
	C. Investigate and explain the banking services available to an agribusiness operation.	Knowledge
	D. Demonstrate cash register operations.	Application/ Psychomotor

SBE LEARNER GOALS	LEARNER OUTCOMES	DEVELOPMENT AND CONCEPT EMPHASIS

AGRICULTURAL SUPPLIES AND SERVICE OCCUPATIONS

The students will demonstrate that they can (Con'd.):

A, C	VI. Investigate and compare the methods of promoting and advertising used in agribusiness while demonstrating the ability to perform those techniques and skills used in the advertising and promotion industry.	
	A. Explain the differences between promotion and advertising.	Knowledge
	B. Outline a promotional program utilizing different audio-visual techniques.	Application
	C. Demonstrate advertising and promotion techniques.	Application
A	VII. Outline the benefits of the microcomputer when operating a business and demonstrate their effective use in an agribusiness.	Application

SBE LEARNER GOALS	LEARNER OUTCOMES	DEVELOPMENT AND CONCEPT EMPHASIS

FOREST MANAGEMENT OCCUPATIONS

The student will demonstrate that they can:

A, B-6, B-7, B-14	I. Develop an appreciation for and understand the historical importance and regional perspectives of trees, forests, and forest products in Minnesota, nationally, and on a global basis.	Affective/ International/ Global/Knowledge
A, B-2, B-3, B-4, B-5, B-6, B-7, B-10, B-14, C	II. Examine and understand the interrelationships between the management of the forest while examining the compatability and conflicts between the pulp, lumber, veneer, post and pole, Christmas tree, and fuel wood industries; and wildlife, outdoor recreation, soil and water management practices, wilderness preserves and/or parks, clean air, maple syrup production, and aesthetics.	Affective/ Knowledge
A	III. Recognize, compare, and explain the diversity of forest ownership including county, state, federal, private, and corporate ownerships.	Knowledge
A	IV. Identify and demonstrate the proper use of forestry tools and equipment.	
	A. Demonstrate tree measuring tools.	Application/ Psychomotor
	B. Identify, discuss, and compare timber harvesting equipment.	Knowledge
	C. Identify, compare, and discuss forest-fire fighting equipment.	Knowledge
	D. Investigate and discuss the equipment used in forest product processing.	Knowledge
	E. Identify and use forest safety equipment.	Application/ Psychomotor
A	V. Demonstrate the proper techniques used in measuring trees, forest, and forest products while applying this data to management plans.	
	A. Determine the diameter of trees and logs.	Application

SBE LEARNER GOALS	LEARNER OUTCOMES	DEVELOPMENT AND CONCEPT EMPHASIS

FOREST MANAGEMENT OCCUPATIONS

The students will demonstrate that they can (Con'd.):

	B.	Estimate the height of standing timber.	Application
	C.	Determine the age of trees.	Application
	D.	Develop a sight index.	Application
	E.	Scale logs.	Application/ Psychomotor
	F.	Cruise a timber plot and analyze the data.	Application/ Psychomotor
	G.	Determine board feet of usable lumber in a log and develop a bill of materials for a specific project.	Application/ Psychomotor
	H.	Estimate the number of cords of lumber in a forest plot or in a pile of cord wood.	Application/ Psychomotor
A, B-6, B-7, C	VI.	Recognize, interpret and demonstrate the silvicultural practices employed in forest management.	
	A.	Investigate and discuss forest soil characteristics and management techniques.	Knowledge
	B.	Demonstrate and use appropriate forest tree propagation methods.	Application/ Psychomotor
	C.	Investigate and discuss forest species selection and genetic improvement technology.	Knowledge
	D.	Examine methods of site preparation and planting techniques.	Knowledge
	E.	Investigate and compare thinning and pruning techniques.	Knowledge
	F.	Investigate and compare harvesting systems.	Knowledge
	G.	Discuss and compare forest cultural techniques including appropriate fertilization, irrigation, and pest control.	Knowledge

SBE LEARNER GOALS	LEARNER OUTCOMES	DEVELOPMENT AND CONCEPT EMPHASIS

FOREST MANAGEMENT OCCUPATIONS

The students will demonstrate that they can (Con'd.):

A, C	VII.	Identify and interpret financial and economic principles used in forest business management.	Integration
A, B-6, B-7	VIII.	Investigate and discuss the basic principles for fire chemistry, its makeup and the different factors associated with fire behavior.	
		A. Identify the components needed for fire.	Knowledge
		B. Describe how fire burns.	Knowledge
		C. Explain how wild land fires spread.	Knowledge
		D. Describe the process of heat transfer in forest fires.	Knowledge
		E. Identify methods used in forest fire prevention and control.	Knowledge
A, B-6, B-7	IX.	Be acquainted with the most common and destructive agents threatening the forests and examine techniques commonly used to protect the forest.	
		A. Identify insect pests and outline control measures.	Knowledge
		B. Identify forest tree diseases and outline methods used in their prevention and control.	Knowledge
		C. Examine wildfire and its control.	Knowledge
		D. Examine the effects of weather on forest production.	Knowledge
A	X.	Investigate systems used for the identification of forest trees and demonstrate that they can identify selected species by leaf or needle, log, lumber, and twig characteristics.	Application

SBE LEARNER GOALS	LEARNER OUTCOMES	DEVELOPMENT AND CONCEPT EMPHASIS

FOREST MANAGEMENT OCCUPATIONS

The students will demonstrate that they can (Con'd.):

A	XI. Demonstrate proper and safe use of the chainsaw in felling, limbing, and bucking of trees.	Application/ Psychomotor
A	XII. Demonstrate proper and safe use of harvesting equipment including skidding, loading, and transporting.	Application/ Psychomotor

SBE LEARNER GOALS	LEARNER OUTCOMES	DEVELOPMENT AND CONCEPT EMPHASIS
	HORTICULTURE OCCUPATIONS	
	The students will demonstrate that they can:	
A	I. Develop an appreciation for and an understanding of horticulture science as the culture of plants used for ornamental, aesthetic, and food purposes.	Affective/ Knowledge
A, C	II. Explain and demonstrate the technology and skills required to successfully produce and market commercial floral crops.	
	A. Identify floral crops.	Application
	B. Prepare soil and planting media.	Application/ Psychomotor
	C. Propagate plant materials.	Application/ Psychomotor
	D. Control plant growth by cultural, environmental and chemical methods.	Application/ Psychomotor
	E. Irrigate plants.	Application/ Psychomotor
	F. Control plant insects, diseases and other pathogens.	Application/ Psychomotor
	G. Harvest floriculture crops.	Application/ Psychomotor
	H. Package, store, ship, and market plant and flower materials.	Application/ Psychomotor
	I. Operate and maintain tools and equipment.	Application/ Psychomotor
	J. Interpret laws and regulations regarding flowers and foliage plants.	Integration
	K. Using preestablished criteria, analyze, judge, and grade floral crops.	Integration
A, C	III. Analyze and demonstrate the technologies and skills required to successfully produce and market commercial vegetable crops.	

SBE LEARNER GOALS	LEARNER OUTCOMES	DEVELOPMENT AND CONCEPT EMPHASIS

HORTICULTURE OCCUPATIONS

The students will demonstrate that they can (Con'd.):

	A. The student will be able to identify vegetable crops.	Application
	B. Propagate vegetable crops.	Application/ Psychomotor
	C. Prepare soil and potting media for vegetable crops.	Application/ Psychomotor
	D. Fertilize vegetable crops.	Application/ Psychomotor
	E. Irrigate vegetable crops.	Application/ Psychomotor
	F. Control pests of vegetable crops.	Application/ Psychomotor
	G. Merchandise and market vegetable crops.	Application/ Psychomotor
	H. Harvest and handle vegetable crops.	Application/ Psychomotor
	I. Control a growing environment for vegetable crops.	Application/ Psychomotor
	J. Using preestablished criteria, analyze, judge and grade vegetable crops.	Integration
A, C	IV. Plan and demonstrate the technology and skills required to successfully produce and market commercial nursery stock including ornamental and shade tree production, ornamental shrubbery, and perennial plants.	
	A. Identify ornamental tree, shrubbery, and perennial plants.	Application
	B. Propagate ornamental tree, shrubbery, and perennial plants.	Application/ Psychomotor
	C. Prepare soil and potting media for ornamental tree, shrubbery, and perennial plants.	Application/ Psychomotor

HORTICULTURE OCCUPATIONS

The students will demonstrate that they can (Con'd.):

	D. Fertilize ornamental tree, shrubbery, and perennial plants.	Application/ Psychomotor
	E. Irrigate ornamental trees, shrubbery, and perennial plants.	Application/ Psychomotor
	F. Control pests of ornamental trees, shrubbery, and perennial plants.	Application/ Psychomotor
	G. Merchandise and market ornamental trees, shrubbery, and perennial plants.	Application/ Psychomotor
	H. Harvest and handle ornamental trees, shrubbery, and perennial plants.	Application/ Psychomotor
	I. Control a growing environment for ornamental trees, shrubbery, and perennial plants.	Application/ Psychomotor
	J. Using preestablished criteria, analyze, judge, and grade ornamental trees, shrubbery and perennial plants.	Integration
A, C	V. Analyze and demonstrate the technology and skills required to successfully produce and market commercial orchard crops.	
	A. Identify commercial orchard crops.	Application
	B. Propagate commercial orchard crops.	Application/ Psychomotor
	C. Prepare soil and potting media for commercial orchard crops.	Application/ Psychomotor
	D. Fertilize commercial orchard crops.	Application/ Psychomotor
	E. Irrigate commercial orchard crops.	Application/ Psychomotor
	F. Control pests of commercial orchard crops.	Application/ Psychomotor

SBE LEARNER GOALS	LEARNER OUTCOMES	DEVELOPMENT AND CONCEPT EMPHASIS

HORTICULTURE OCCUPATIONS

The students will demonstrate that they can (Con'd.):

	G. Merchandise and market commercial orchard crops.	Application/ Psychomotor
	H. Harvest and handle commercial orchard crops.	Application/ Psychomotor
	I. Control a growing environment for commercial orchard crops.	Application/ Psychomotor
	J. Using preestablished criteria, analyze, judge, and grade commercial orchard crops.	Integration
A, C	VI. Identify and explain the technology and skills required to successfully produce and market a commercial turf crop.	
	A. Identify commercial turf crops.	Application
	B. Produce commercial turf crops.	Application/ Psychomotor
	C. Prepare soil and media for commercial turf crops.	Application/ Psychomotor
	D. Fertilize commercial turf crops.	Application/ Psychomotor
	E. Irrigate commercial turf crops.	Application/ Psychomotor
	F. Control pests of commercial turf crops.	Application/ Psychomotor
	G. Merchandise and market commercial turf crops.	Application/ Psychomotor
	H. Harvest and handle commercial turf crops.	Application/ Psychomotor
	I. Control a growing environment for commercial turf crops.	Application/ Psychomotor
	J. Using preestablished criteria analyze, judge, and grade commercial turf crops.	Integration

SBE LEARNER GOALS	LEARNER OUTCOMES	DEVELOPMENT AND CONCEPT EMPHASIS

HORTICULTURE OCCUPATIONS

The students will demonstrate that they can (Con'd.):

A, C	VII. Identify, explain and demonstrate the basic skills required to produce a commercially acceptable retail floral business product.	
	A. Understand and demonstrate the effect of color, form, line, design, and aesthetic value while creating a retail floral product.	Affective/ Application/ Psychomotor
	B. Interpret the effect of season, occasion, and customer expectations on product marketability.	Affective/ Integration
A, C	VIII. Analyze and demonstrate the technology and skills required to successfully produce a landscape design.	
	A. Develop an appropriate presentation.	Application
	B. Demonstrate form, material selection, and discuss aesthetic value.	Affective/ Application
	C. Develop appropriate price estimates for a landscape design.	Application
	D. Discuss the similiarities and differences between residential and commercial landscape applications.	Knowledge
A, C	IX. Interpret blueprints and apply basic skills which meet comercially acceptable standards, construct an appropriate landscape structure, plant flowers, shrubs, trees, and ground covers and properly place sod.	Integration/ Psychomotor
A, C	X. Interpret blueprints, design and apply knowledge, while constructing and/or maintaining athletic turf and outdoor athletic fields.	Integration/ Psychomotor
A, C	XI. Sketch and design basic public parks and, given a set of criteria, present a plan for a private or public recreational area.	Integration/ Psychomotor

SBE LEARNER GOALS	LEARNER OUTCOMES	DEVELOPMENT AND CONCEPT EMPHASIS

HORTICULTURE OCCUPATIONS

The students will demonstrate that they can (Con'd.):

A, C	XII.	Identify and understand the types of business management structures of and become familiar with the specific and unique business activities of retail garden centers, floral shops, and landscape and nursery businesses.	Knowledge
A, C, E-1, E-2, E-3, E-5	XIII.	Appreciate the aesthetics of design while recognizing, understanding and valuing the influence of geographic regions and other cultures on materials, products, and designs specific to the horticulture industry.	Affective/ Integration/ International/ Global

SBE LEARNER GOALS	LEARNER OUTCOMES	DEVELOPMENT AND CONCEPT EMPHASIS
	NATURAL RESOURCE MANAGEMENT OCCUPATIONS	
	The students will demonstrate that they can:	
A, B-6, B-7, C, F	I. Explain the importance of conserving and managing the world's natural resources while interpreting the interrelationships of the micro and macro ecosystems on the local, state, national, and global basis.	Integration/ International/ Global
A	II. Develop an appreciation for nature and the outdoors.	Affective/ Knowledge
A, B-6, B-7, C	III. Explain the importance of and interpret the inter-relationships between the conservation and management of air, soil, and water while studying the effects of pollution and waste management and their combined effects on all natural resources.	Integration
A, B-6, B-7, C	IV. Identify, interpret and develop management plans for selected fish and wildlife in Minnesota including fish, waterfowl, upland game birds, mammals, and non-game animals.	
	A. Explain and interpret habitat requirements.	Integration
	B. Develop a restocking plan.	Application
	C. Develop an intensive five year management plan for one species of wildlife.	Application
A, B-6, B-7, C, D	V. Explain the relationship of hunting and fishing regulations to the personal and recreational needs of the individual while analyzing the contributions of those seasons to the local and state economy.	Integration
A, B-6, B-7, C	VI. Develop an appreciation for and explain the importance of forestry as an industry in Minnesota while interpreting the interrelationships of forest management practices to all natural resources including fish, waterfowl, upland game birds, mammals, and non-game animals.	Affective/ Integration

SBE LEARNER GOALS	LEARNER OUTCOMES	DEVELOPMENT AND CONCEPT EMPHASIS

NATURAL RESOURCE MANAGEMENT OCCUPATIONS

The students will demonstrate that they can (Con'd.):

A, D-2, F	VII.	Explain the operations and interrelationships of the government agencies regulating natural resources.	Knowledge
		A. U.S. Forest Service.	
		B. U.S. Fish and Wildlife Service.	
		C. Bureau of Land Management.	
		D. Bureau of Indian Affairs.	
		E. Minnesota Department of Natural Resources.	
		F. National and State Park Services.	
		G. County Government.	
		H. Private Resource Management.	

SBE LEARNER GOALS	LEARNER OUTCOMES	DEVELOPMENT AND CONCEPT EMPHASIS

PRODUCTION AGRICULTURE

The students will demonstrate that they can:

A, B-6, B-7, B-10, C, D-2

1. Interpret the effects and interrelationships of the specific factors required to successfully produce agricultural crops.

   A. Investigate and select appropriate crops including speciality crops. — Integration

   B. Explain an economic decision making process used to determine which crop to select based on the following economic principals: point of diminishing return, supply and demand, futures, insurance, hedging, etc. — Knowledge

   C. Investigate and describe the effects of plant breeding, genetics, and biotechnology on variety selection. — Knowledge

   D. Investigate and develop a cultural practices plan for several crops.

      1. Evaluate soil and select crops based on soil classification, nutrient requirements, and water availability. — Integration

      2. Describe the requirements and effects of air, sunlight, growing seasons, and heat unit days. — Knowledge

      3. Evaluate integrated pest management (mechanical, biological and chemical) techniques to be used. — Integration

   E. Discuss the options available in crop harvesting, transporting, storage, and processing. — Knowledge

   F. Investigate marketing options and compare those options for each crop. — Knowledge

   G. Using preestablished criteria make value judgments in grading, judging, classifying, and selecting seeds and crops while defending the reasons for the subsequent decisions. — Integration

SBE LEARNER GOALS	LEARNER OUTCOMES	DEVELOPMENT AND CONCEPT EMPHASIS

PRODUCTION AGRICULTURE

The students will demonstrate that they can (Con'd.):

A, B-6, B-7, B-10, C, D-2	II. Interpret the effects and interrelationships of the specific factors required to successfully produce livestock, poultry, and companion or recreational animals.	
	A. Investigate and develop a management plan for several species of livestock.	
	1. Explain an economic decision making process used to determine which species of livestock to select based on appropriate economic principals.	Knowledge
	2. Investigate and describe the effects of animal genetics, breeding, and biotechnology on animal selection.	Knowledge
	3. Summarize current technology in animal nutrition and formulate rations.	Knowledge
	4. Develop a plan for proper animal health and sanitation.	Application
	5. Investigate and describe appropriate environmental and housing requirements.	Knowledge
	6. Discuss herdsman safety and sanitary procedures when working with animals.	Knowledge
	7. List and explain the approved management and nurturing techniques required by various species of livestock.	Knowledge
	8. Investigate marketing options and select the appropriate options for various species of livestock.	Integration
	B. Fit, show, and exhibit livestock.	Application/ Psychomotor
	C. Using pre-established criteria make value judgments in grading, rating, judging, and selecting livestock while defending the reasons for the subsequent decisions.	Integration

SBE LEARNER GOALS	LEARNER OUTCOMES	DEVELOPMENT AND CONCEPT EMPHASIS

PRODUCTION AGRICULTURE

The students will demonstrate that they can (Con'd.):

A, B-6, B-7, B-10, C, D-2	III. Investigate and understand the effects and interrelationships of applying appropriate soil and water management practices on successful agricultural production now and in the future.	
	A. Discuss practical conservation techniques used in specific geographic areas.	Knowledge
	B. Identify and appreciate those cultural practices used in proper "stewardship of the land."	Affective/ Knowledge
	C. Outline the cause, effect, and appropriate management practices for preventing soil erosion and sedimentation while presenting plans for drainage systems on different classes of land.	Application
	D. Explain the different irrigation systems.	Knowledge
	E. Demonstrate land measurement, slope calculation, and contour lines.	Application/ Psychomotor
	F. Investigate and outline the available contemporary plant and soil analysis technology.	Knowledge
	G. Using preestablished criteria make value judgments in classifying and selecting land for appropriate purposes while defending the reasons for the subsequent decisions.	Integration
A, C	IV. Understand and interpret the effects of incorporating the appropriate mechanical technology into the total farm operation and understand its intricate relationships and importance to successful agriculture production.	
	A. Compare, select, and apply appropriate sources of agricultural power.	Knowledge
	B. Compare and select the appropriate agricultural machinery and equipment.	Knowledge
	C. Compare and apply appropriate criteria in selecting and constructing agricultural structures.	Application

SBE LEARNER GOALS	LEARNER OUTCOMES	DEVELOPMENT AND CONCEPT EMPHASIS
	PRODUCTION AGRICULTURE	
	The students will demonstrate that they can (Con'd.):	
	D. Compare, select, and install safe electrical circuits and devices using preestablished criteria and codes.	Application/ Psychomotor
	E. Examine the value of and demonstrate the necessary skills required in welding, cutting, and repair of equipment.	Application/ Psychomotor
	F. Compare and describe hydraulic components.	Knowledge
	G. Explain fabrication procedures.	Knowledge
	H. Identify, compare, and select materials handling equipment, vehicles and buildings.	Knowledge
	I. Identify the components of modern agriculture which can use robotic technology.	Knowledge
A, B-3, B-10, C, D-2, E, F, K	V. Investigate and understand the complexities involved in producing a marketable, aesthetically pleasing, palatable, quality product for a diet-conscious consumer.	Affective/ International/ Global/Knowledge/Multicultural/Gender Fair
A, B-2, B-10, C, D, E, F, K	VI. Appreciate, analyze, understand and interpret the effects and interrelationships of local, national, and world economic forces on production agriculture.	
	A. Apply those economic principles and concepts used in analyzing the farm business and making farm management decisions.	Application
	B. Analyze and select the most appropriate type of farm business organization for a given farm situation.	Integration
	C. Explain how the modern manager can use records and manage resources for optimum returns on investment.	Knowledge
	D. Understand the economic principles that affect all of agriculture and what unique micro-economic forces affect production agriculture.	Knowledge

SBE LEARNER GOALS	LEARNER OUTCOMES	DEVELOPMENT AND CONCEPT EMPHASIS

PRODUCTION AGRICULTURE

The students will demonstrate that they can (Con'd.):

A, B-10, B-12, C	VII. Recognize, interpret, and incorporate financial and economic management principles used to make sound financial decisions leading to successful agricultural production.	
	A. Investigate and assess the importance of budgeting.	Knowledge
	B. Interpret record keeping and analysis systems.	Integration
	C. Describe and compare the principles of agricultural finance, credit and agricultural tax laws.	Knowledge

Chapter 4

Agriculture/Agribusiness Education

Transposing Model Learner Outcomes Into Curriculum

CHAPTER IV

A SUGGESTED PLAN FOR PLANNING

Learner Outcomes in agriculture education were developed to aid in the formulation of local agriculture education learner outcomes. A statewide committee of agriculture education instructors, teacher educators, and interested persons from business and industry assisted in the development of a statement which identifies the direction of agriculture education in Minnesota (Chapter Two) and organized a listing of learner outcomes (Chapter Three). The learner outcomes presented in this document are suggested model outcomes.

After completing a student and community needs assessment and facility appraisal, additional learner outcomes may be identified by the instructional staff, local program advisory committee, administration and Board of Education to serve the unique needs of their students. This chapter provides examples of transposing state learner outcomes into local learner outcomes and curriculum.

It is clear that the first step in any planning process is an assessment of where one is now - what the present agriculture program is like. It is also clear that the planning process is not absolutely linear; there may not be a clean place to start the process, nor may there be an obvious end point. No single sequence of activities will fit all agriculture education assessment and curriculum implementation efforts. Such efforts are influenced by variables, such as the district's current level of curriculum implementation; district commitment of time, materials and formal resources; the ability, willingness and opportunity of those involved to participate fully; what is known about the students and the community; the teaching assignment; and the cultural attitudes and policies of the school and community, either explicit or implicit, that determine the agriculture education curriculum.

It takes energy and considerable commitment to embark on an assessment of an agriculture education curriculum with an eye to improving it. It also is a time consuming process. It may, however, become an enormously satisfying task to agriculture teachers as the improvement of the curriculum is a problem solving process and the search for solutions to problems is a process close to the hearts of all agriculture educators.

One has to start somewhere. We must use steps or stages. The order may vary. We expect that you may vary the sequence and develop your own process for redefining and designing the agriculture education curriculum in your school. Good luck.

The Process

The following scheme provides a series of steps to follow when developing local learner outcomes. It is not a required procedure but merely a set of guidelines, suggestions and targets to facilitate planning.

1. Identify your team. This may be a problem in smaller districts. The greatest problems may be lack of staff trained in curriculum development and too few staff members in the content area to provide breadth and depth. One suggested solution is having the area agriculture instructors form a committee. This has the advantage of broadening the base of knowledge available and spreading out the work load. It is not recommended that a one person agriculture teacher department "single handedly" attempt to write local learner outcomes and curriculum for each of the courses in the department in a short period of time. It is also not a recommended procedure to involve the local advisory committee in the initial writing phase of the initial committee. A team of four to seven agriculture teachers is considered optimum.

2. Define The Team's Role. The work of the committee most always calls for change and innovation. This implies decisions. Is this committee or "task force" advisory? To whom will it make recommendations? Or is the task force involved in a first step, seeking clarification and agreement on the agriculture education program? Your original task force may be interested only in developing a framework for learner outcomes, matching units of instruction to them, and specifying what students will learn and do in those units. This by no means is a small task.

3. Negotiate Resources. These include time (release time, staff meetings, task force meetings, and evaluation time), money (budget for committee, substitutes, materials, travel) and support services (typing and reproduction costs).

4. Inservice Your Team. Arrange for training of your team members on expectations for product form and content, while providing information on how to write outcomes. Collect and disseminate samples and models of learner outcomes.

5. Determine Needs of Local Districts. The needs of the local district are being determined on a continuing basis whether formally or informally. Successful agriculture departments always have their fingers on the "pulse" of the community. They are constantly "reading" the attitudes, ideas, trends and needs of the students in the area. Modern agriculture programs must meet the needs of an emerging agricultural industry. Adjustments in curriculum and objectives are being made in a proactive rather than a reactive mode.

   Agriculture departments must become involved in technological advancement and present themselves as a dynamic and changing educational delivery system that is on the cutting edge of progress in the agricultural industry. Learner outcomes must be

established to update the instructional program with emphasis on agri-science skills. These skills must be developed through both traditional and innovative teaching approaches including experiential activities, leadership development, problem solving and other applied techniques. Modification of traditional supervised occupational experience programs may be needed. For example, a student who desires to become employed in international agriculture may need to receive supervised occupational experience program credit in an entirely different manner than would the traditional production agriculture or agribusiness student. It may be necessary to quantity experiential programs in agriculture in terms other than dollars earned and hours worked.

A discussion of the needs of the local agriculture department is an appropriate topic for the local advisory committee for agriculture and also for discussion with the local administration. Remember that as the agriculture instructor you are the "expert" in curriculum in your area. Do not forfeit your right to formulate a recommendation. Make use of your expertise, along with guidance and materials from the agriculture education section of the Minnesota Department of Education and the University of Minnesota.

Use the model learner outcomes as presented in Chapter Three of this document as a guide to determine program areas to be included in your curriculum. Remember that the "General Learner Outcomes" should be included in all curriculums for all students.

Select learner outcomes that reflect the overall learner goals of the district and those of the Minnesota Department of Education. The agriculture education staff (or a task force of agriculture teachers from area schools) should meet to select learner outcomes from the Minnesota Learner Outcomes Document. Outcomes should reflect the district mission statement and goals. The selected learner outcomes must include the "General Learner Outcomes" as a core for all agriculture department's curriculum.

6. Present Learner Outcomes for Review and Approval. The selected outcomes for the local department should be taken to the agriculture advisory committee for review, approval and recommendation. Depending on district policy, this step must be coordinated with the building principal, vocational director, curriculum coordinator and/or the superintendent. After approval of selected local learner outcomes in agriculture, by both the local advisory committee and the appropriate administrators, the document should be taken to the local Board of Education for official adoption.

7. Present the Outcomes to the Local Board of Education for Official Adoption by the District. After you have a recommendation of the local advisory committee and the support of appropriate administrators, take the selected learner outcomes to the local Board of Education for adoption. It is important that the document be presented to the superintendent well in advance of the Board

meeting with all appropriate supporting documents so it can be distributed to the Board of Education for their review prior to the meeting. Do a professional job on your proposal - it is a direct reflection on you and your department. A well planned and professionally presented document will greatly enhance the department's image with the Board and facilitate its approval. Upon approval of selected learner outcomes in agriculture by the Board of Education, the curriculum writing (revision process) may begin.

8. After Board Approval, Use the Selected Learner Outcomes to Develop the Curriculum for Each Course in the Curriculum. On the following pages are the curriculum development forms with instructions. Blank forms are included for the instructor to duplicate for use in local curriculum development. Many schools have their own forms and formats for learner outcome and curriculum development. Use any proven system, with examples as a guide, to develop the department curriculum.

_____ HIGH SCHOOL

PLANNING LEARNER OUTCOMES IN AGRICULTURE EDUCATION

INSTRUCTORS _____ DATE COMPILED _____

Regular School Year Courses/Experiences/Activities	Grades Eligible
I. S.O.E. (Experiental Activities)	
II. FFA (Youth Organization)	
III.	
IV.	
V.	
VI.	
VII.	
VIII.	
IX.	
X.	
XI.	

Summer Offerings Courses/Experiences/Activities	Grades Eligible
I. S.O.E. (Experiential Activities)	
II. FFA (Youth Organization)	
III.	
IV.	
V.	
VI.	

FORM I

_____ HIGH SCHOOL

PLANNING LEARNER OUTCOMES IN AGRICULTURE EDUCATION

INSTRUCTORS _____ DATE COMPILED _____

Course/Experience/Activity (from Form I): _____

Length of Course: _____ instructional hours.

Grade levels in Course: _____

Brief Description of Course: _____

_____

_____

_____

_____

Selected Learner Outcomes from State Learner Outcome guide	Level* A, E M. R	Dist. Goal #'s	Course Time Allocation (Hours)
General Learner Outcomes: Every student must be exposed to the eleven GLO's at the "emphasis" level sometime in the departmental curriculum.			

*Enter an "A" for the Learner Outcome in which "Awareness" instruction is provided.
Enter an "E" for the Learner Outcome in which "Emphasis" instruction is provided.
Enter an "M" for the Learner Outcome in which "Mastery" attainment is expected.
Enter an "R" for the Learner Outcome in which "Reinforcement or Review" instruction is provided.

Planning Learner Outcomes in Agriculture Education (Continued)

Course/Experience/Activity_____ Page_____

Selected Learner Outcomes from State Learner Outcome guide	Level* A, E M. R	Dist. Goal #'s	Course Time Allocation (Hours)

_____ HIGH SCHOOL

PLANNING LEARNER OUTCOMES IN AGRICULTURE EDUCATION

LOCAL LEARNER OUTCOME AND CURRICULUM DEVELOPMENT:

Course/Experience/Activity (from Form I):_____

Length of Course:_____instructional hours.

State Learner Outcomes:

Course Time Allocation_____hours. Level (Circle one) A, E, M. R.

Instructional Materials: (References, Audio Visual Aides, Resources, Field Trips, Computer Applications).

1. _____

2. _____

3. _____

4. _____

5. _____

Local Learner Outcome	Content and Activities

Planning Learner Outcomes in Agriculture Education (Continued)

Local Learner Outcomes and Curriculum Development:
Course/Experience/Activity_____ Page_____

Local Learner Outcome	Content and Activities

FORM III (Cont.)

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